

IN THE CLAIMS

Please amend the claims as follows:

1. – 15. (Cancelled)

16. (Currently Amended) A method of producing chemiluminescence in a solid phase immunoassay, comprising:

contacting at least one antigen or/and an antibody immobilized onto fine solid carriers dispersed in a liquid medium with a chemiluminescent substrate comprising:

at least one dioxetane,

an enzyme for performing chemiluminescence, and

at least one of a water soluble macromolecular quaternary ammonium salt

chemiluminescence enhancer, a water soluble macromolecular sulfonium salt

chemiluminescence enhancer or a water soluble macromolecular quaternary

phosphonium salt chemiluminescence enhancer

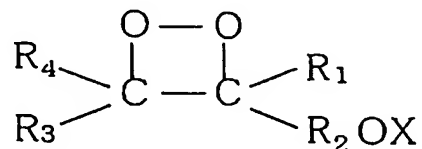
each of which has been treated with an oxidizing agent or a reducing agent and

each of which is capable of enhancing the emission of light caused by the

reaction of the chemiluminescent substrate with the enzyme.

17. (Previously Presented) The method according to claim 16, wherein the chemiluminescence enhancer does not substantially comprise a component with a molecular weight of more than 400,000 daltons in molecular weight as separated by an ultrafiltration method.

18. (Currently Amended) The method according to claim 16, wherein the chemiluminescent substrate ~~comprising~~ comprises at least one dioxetane represented by general formula:



wherein R₂ is an aryl group substituted with an X-oxy group, which forms 1,2-dioxetane compound which is an unstable oxide intermediate when X is eliminated by activator enzyme to induce a reaction, which unstable 1,2-dioxetane compound is decomposed with releasing electron energy to produce light and two carbonyl-containing compounds of general formulae,



and X is a chemically easily reactive group which is eliminated by an enzyme;

R₁ is one selected from the group consisting of an alkyl group, an alkoxy group, an aryloxy group, a dialkylamino group, a trialkylsilyloxy group, an arylsilyloxy group, an aryl group and an aryl group which is bound to an aryl group R₂ to form a polycyclic aryl group with X-oxy group substitution, which spiro-binds to a 1,2-dioxetane ring;

R₃ and R₄ are each an alkyl group or a heteroalkyl group, or R₃ and R₄ may be together bound to form a polycyclic alkylene group which spiro-binds to the 1,2-dioxetane ring.

19. (Currently Amended) The method according to claim 16, wherein the ~~chemiluminescent~~ chemiluminescence enhancer is prepared from a monomer selected from the group consisting of a quaternary ammonium salt, a sulfonium salt, a quaternary phosphonium salt, and mixtures thereof.

20. (Currently Amended) The method according to claim 16, wherein the ~~chemiluminescent~~ chemiluminescence enhancer is a polymerized quaternary ammonium salt, a polymerized sulfonium salt, a polymerized quaternary phosphonium salt, or copolymers thereof.

21. (Currently Amended) The method according to claim 16, wherein the ~~chemiluminescent~~ chemiluminescence enhancer is selected from the group consisting of poly[vinylbenzyl(benzylmethyl ammonium chloride)], poly(vinylbenzyltrimethyl ammonium chloride), poly[vinylbenzyl(tributyl ammonium chloride)], benzylmethylethyl ammonium chloride, polymethacrylamidepropylenemethyl ammonium chloride, poly[vinylbenzyl(triethyl ammonium chloride)], poly[vinylbenzyl(2-benzylamino)ethyldimethyl ammonium chloride], poly[vinylbenzyldimethyl(2-hydroxy)ethyl ammonium chloride], poly[vinylbenzyl(trimethylphosphonium chloride)], poly[vinylbenzyl(tributylphosphonium chloride) and poly[vinylbenzyl(trioctylphosphonium chloride)] and copolymers thereof.

22. (Previously Presented) The method according to claim 16, wherein the solid carrier is a particle.

23. (Previously Presented) The method according to claim 22, wherein the particle is a magnetic particle.

24. (Previously Presented) The method according to claim 16, wherein the chemiluminescence enhancer has been treated with at least one oxidizing agent or a reducing agent selected from the group consisting of ammonium persulfate, sodium sulfite, sodium hypochlorite, hydrogen peroxide, sodium metaperiodate, potassium permanganate and potassium dichromate.

25. (Previously Presented) The method according to claim 16, wherein the enzyme is at least one of acid phosphatase, alkali phosphatase, glucosidase, glucuronidase or esterase.